BCS THE CHARTERED INSTITUTE FOR IT

BCS HIGHER EDUCATION QUALIFICATIONS
BCS Level 6 Professional Graduate Diploma in IT

WEB ENGINEERING

Monday 24th April 2023 - Afternoon

Answer **any** THREE questions out of FIVE. All questions carry equal marks.

Time: THREE hours

Answer any Section A questions you attempt in Answer Book A
Answer any Section B questions you attempt in Answer Book B

The marks given in brackets are **indicative** of the weight given to each part of the question.

Calculators are NOT allowed in this examination.

A1.

a) Give descriptions of the following five URL definitions:

    i)   2021 News
    ii)   <a href="2021/March.html">
      same as http://www.xyz.com/news/2021/March.html
    iii) <a href="/stock/quote.html">
      same as http://www.xyz.com/stock/quote.html
    iv) <a href="#sec3">
    v) ...

(10 marks)

b) Use HTML to define a draggable rectangle.

(5 marks)

c) The XML file in the following diagram (Fig. 1.c) shows a process: read XML file, extract the element values from the XML to perform a database access such as insert, update, etc.

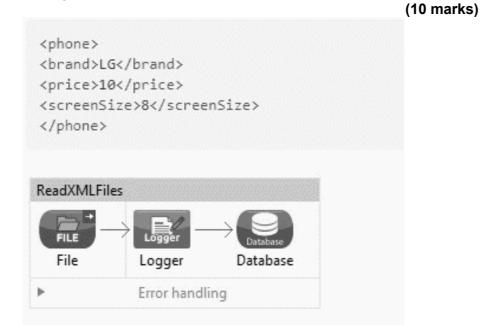 What are the stages that are needed to complete this task?

(10 marks)


```
<phone>
<brand>LG</brand>
<price>10</price>
<screenSize>8</screenSize>
</phone>
```

ReadXMLFiles

FILE   Logger   Database

File   Logger   Database

► Error handling

Fig.1c

A2.

a) You are building a website for your local football team. This website will include a minimum of five pages. Provide a test plan covering the points below to test the completed website:

    i)   HTML validity;
    ii) CSS validity;
    iii) RSS feed checker;
    iv) Colour contrast;
    v) WCAG guidelines.

(10 marks)

b) When developing a proprietary-based enterprise framework, the quality control of the system is crucial. At the stage of starting a project, quality control will depend on assessing web usability and choosing the right web development technology and leveraging cost-effective hosting infrastructure. At the final stage, the system and software quality model also need to follow an ISO-IEC standard. Describe **FIVE** of the quality models that can be used for quality assurance.

(10 marks)

c) Pattern recognition is important in web applications and it is imperative that website designers understand it when designing a site. Explain what these regular expression patterns are used for:

    i)   /abc/
    ii) /ab*c/
    iii) /a-c/
    iv) /chapter (\d+)\.\d*/
    v) /a[bcd]*b/

(5 marks)

[Turn Over]

A3.

a) Give **ONE** example of when an XML document needs to be transformed into another XML document.

(5 marks)

b) Write complete XSLT code to render the XML document below.

output the following XML :

```
<?xml version="1.0"?>
<?xml-stylesheet type="text/xsl" href="example.xsl"?>
<Article>
  <Title>My Article</Title>
  <Authors>
    <Author>Mr. Foo</Author>
    <Author>Mr. Bar</Author>
  </Authors>
  <Body>This is my article text.</Body>
</Article>
```

```
Article - My Article
Authors:
- Mr. Foo
- Mr. Bar
```

Fig. 3.b

(5 marks)

c) Write complete XSLT code to render the XML data show in figure 3.c below.

(10 marks)

Title	Artist
Empire Burlesque	Bob Dylan
Hide your heart	Bonnie Tyler
Greatest Hits	Dolly Parton
Still got the blues	Gary Moore
Eros	Eros Ramazzotti
One night only	Bee Gees
Sylvias Mother	Dr.Hook

Fig 3.c

d) Explain how to parse Json & XML using the same code in Java.

(5 marks)

Section B
Answer Section B questions in Answer Book B

B4.

a) What is JavaScript (JS) and why is it used in web applications? How does it differ from Java?

(5 marks)

b) You have been asked to provide a basic registration form for the BCS Advanced Diploma examinations. A basic design is shown in Figure 4b. Construct a web page using JavaScript to implement this page, clearly describing the methods you have chosen and justify why you chose these methods.

BCS Examinations

First Name: [_____] Second Name: [_____]

Examination Number: [_____]
Centre: [_____]

Please select the examinations for you wish to register:

Advanced database management systems:	☐
Management Information Systems:	☐
Software engineering (part 2):	☐
Computer services management:	☐
Network information systems:	☐
Programming paradigms:	☐
System design methods:	☐
Web engineering:	☐
IT and the environment:	☐

[Submit]

Figure 4b.

(12 marks)

c) Provide a suitable confirmation page to ensure that the Name, Examination Number, Centre are completed, and exactly **FOUR** examinations are chosen. You may use php or other suitable development tool to build an additional page that checks the input and informs the user of any missing or incorrect information. You should clearly discuss the options you have made and the reasons for them.

(8 marks)

B5.

a) What are cookies in the context of web applications?

(5 marks)

b) Discuss the different types of cookies used in web browsers and explain their usage.

(10 marks)

c) There is considerable discussion about the abuse of cookies and legislatures have taken action to legitimise their use. Evaluate the risks associated with the use of cookies and how these can be addressed.

(10 marks)

END OF EXAMINATION